

WHAT IS CLAIMED IS:

1 1. A multicolor display comprising
2 a substrate; and
3 at least one multicolor generation site coupled to said substrate, each of
4 said at least one multicolor generation sites comprised of:
5 at least two light emitting regions proximate to one another;
6 at least one wavelength conversion layer applied to at least one of
7 said at least two light emitting regions, wherein said at least two light emitting
8 regions in combination with said at least one wavelength conversion layer emit at
9 least two different colors; and
10 an opaque material interposed between said at least two light
11 emitting regions, said opaque material preventing cross-talk between said at least
12 two light emitting regions.

1 2. A multicolor display comprising
2 a substrate; and
3 a multicolor generation site grown on said substrate comprising:
4 at least two LEDs proximate to one another;
5 a first wavelength conversion layer applied to a light emitting
6 surface of a first of said at least two LEDs, wherein said at least two LEDs in
7 combination with said first wavelength conversion layer emit at least two different
8 colors; and
9 an opaque material interposed between said at least two LEDs, said
10 opaque material preventing cross-talk between said at least two LEDs.

1 3. The multicolor display of claim 2, wherein said at least two LEDs
2 are comprised of three individual LEDs proximate to one another.

1 4. The multicolor display of claim 3, further comprised of a second
2 wavelength conversion layer applied to a light emitting surface of a second of said three
3 individual LEDs, wherein said three individual LEDs in combination with said first and
4 second wavelength conversion layers emit three different colors.

1 5. The multicolor display of claim 2, wherein said at least two LEDs
2 emit light at a wavelength in the range of wavelengths between 4,000 and 4,912
3 Angstroms.

1 6. A multicolor display comprising
2 a substrate; and
3 a plurality of multicolor generation sites grown on said substrate, each of
4 said plurality of multicolor generation sites comprised of:
5 at least two LEDs proximate to one another;
6 a wavelength conversion layer deposited on a light emitting surface
7 of a first of said at least two LEDs, wherein said at least two LEDs in combination
8 with said wavelength conversion layer emit at least two different colors; and
9 an opaque material interposed between said at least two LEDs, said
10 opaque material preventing cross-talk between said at least two LEDs.

1 7. The multicolor display of claim 6, further comprising an index
2 matching layer interposed between said wavelength conversion layer and said light
3 emitting surface of said first LED.

1 8. The multicolor display of claim 6, further comprising a protective
2 layer deposited on an exterior surface of said wavelength conversion layer.

1 9. The multicolor display of claim 6, further comprising a protective
2 layer deposited on a light emitting surface of a second of said at least two LEDs.

1 10. The multicolor display of claim 6, wherein said substrate is
2 selected from the group consisting of sapphire, silicon carbide and gallium nitride.

1 11. The multicolor display of claim 6, wherein said at least two LEDs
2 emit light at a wavelength in the range of wavelengths between 4,000 and 4,912
3 Angstroms.

1 12. The multicolor display of claim 6, further comprising a cross-talk
2 minimization layer interposed between said substrate and said at least two LEDs.

1 13. The multicolor display of claim 12, wherein said cross-talk
2 minimization layer is comprised of a Bragg reflector.

1 14. The multicolor display of claim 12, wherein said cross-talk
2 minimization layer is comprised of a partially absorbing layer.

1 15. A multicolor display comprising
2 a substrate; and
3 a plurality of multicolor generation sites grown on said substrate, each of
4 said plurality of multicolor generation sites comprised of:
5 three LEDs proximate and immediately adjacent to one another;
6 a first wavelength conversion layer deposited on a light emitting
7 surface of a first of said three LEDs; and
8 a second wavelength conversion layer deposited on a light emitting
9 surface of a second of said three LEDs, wherein said three LEDs in combination
10 with said first and second wavelength conversion layers emit three different
11 wavelengths; and
12 an opaque material interposed between said three LEDs, said
13 opaque material preventing cross-talk between said three LEDs.

1 16. The multicolor display of claim 15, wherein said substrate is
2 selected from the group consisting of sapphire, silicon carbide and gallium nitride.

1 17. The multicolor display of claim 15, wherein said first and second
2 wavelength conversion layers are selected from the group of materials consisting of
3 phosphors and active polymers.

1 18. The multicolor display of claim 15, wherein said three LEDs emit
2 light at a wavelength in the range of wavelengths between 4,000 and 4,912 Angstroms.

1 19. The multicolor display of claim 15, wherein said first wavelength
2 conversion layer converts light in a first wavelength range of between 4,000 and 4,912
3 Angstroms to light in a second wavelength range of between 4,912 and 5,750 Angstroms.

1 20. The multicolor display of claim 15, wherein said second
2 wavelength conversion layer converts light in a first wavelength range of between 4,000

3 and 4,912 Angstroms to light in a second wavelength range of between 6,470 and 7,000
4 Angstroms.

1 21. The multicolor display of claim 15, further comprising:
2 a first index matching layer interposed between said first wavelength
3 conversion layer and said light emitting surface of said first LED; and
4 a second index matching layer interposed between said second wavelength
5 conversion layer and said light emitting surface of said second LED.

1 22. The multicolor display of claim 15, further comprising:
2 a first protective layer deposited on an exterior surface of said first
3 wavelength conversion layer; and
4 a second protective layer deposited on an exterior surface of said second
5 wavelength conversion layer.

1 23. The multicolor display of claim 22, wherein said first and second
2 protective layers are equivalent layers.

1 24. The multicolor display of claim 22, further comprising a third
2 protective layer deposited on a light emitting surface of a third of said three LEDs.

1 25. The multicolor display of claim 15, further comprising a plurality
2 of channels within said substrate, said plurality of channels separating adjacent LEDs of
3 said three LEDs, wherein said opaque material is deposited within said plurality of
4 channels.

1 26. The multicolor display of claim 15, further comprising a cross-talk
2 minimization layer interposed between said substrate and said at least two LEDs.

1 27. The multicolor display of claim 26, wherein said cross-talk
2 minimization layer is comprised of a Bragg reflector.

1 28. The multicolor display of claim 26, wherein said cross-talk
2 minimization layer is comprised of a partially absorbing layer.